

Appl. No. 09/530,900
Amendment Dated August 19, 2003
Responsive to Final Action of April 25, 2003

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

Claim 1 (currently amended): A compact, self-contained and moveable apparatus for treating wastewater containing a substantial volume of water and substantially lesser amounts of, at water boiling points, non-volatile contaminants, the apparatus comprising:

- (a) a fluid vessel to collect wastewater and having at least a partially open top wall, side walls and a bottom wall side walls and at least a partially open top,
- (b) means for delivering wastewater to the fluid vessel,
- (c) a heating vessel surrounding and spaced from at least the side walls and the bottom wall of the fluid vessel to form with the fluid vessel side walls and bottom wall an interior heating chamber between the heating vessel and the fluid vessel comprising a bottom space extending across the bottom wall of the fluid vessel and side spaces extending the height of the side walls of the fluid vessel,
- (d) a heat transfer liquid having a boiling point substantially in excess of the boiling point of the collected wastewater and filling at least the bottom space and a substantial portion of the side spaces of the heating chamber around the fluid vessel side walls and bottom wall,
- (e) a heating element positioned in the heating chamber to generate heat sufficient to vaporize the wastewater and form water vapor but not vaporize the heat transfer liquid, (e) a heat transfer liquid having a boiling point substantially in excess of the boiling point of the collected wastewater and filling at least a substantial portion of the heating chamber and immersing the heating element immersed in the heat transfer liquid by which to transfer heat generated by the heating element is transferred to the fluid vessel side walls and bottom wall to heat the collected wastewater until it is vaporized,
- (f) means connected to the heating element for activating the heating element to

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heat the heat transfer liquid,

[[(f)]] (g) an outer jacket substantially surrounding the heating vessel and spaced from the heating vessel to define an insulating space between the jacket and heating vessel, and
[[(g)]] (h) vapor exhaust means for expelling the water vapor from the fluid vessel.

Claim 2 (currently amended): Apparatus for treating wastewater according to Claim 1, wherein the heat transfer liquid is a mineral oil heatable to a temperature of 600 F.

Claim 3 (previously presented): Apparatus for treating wastewater according to Claim 1 and further comprising means for causing ambient air to flow through the insulating space to facilitate vapor exhaust and to cool the outer jacket.

Claim 4 (previously presented): Apparatus for treating wastewater according to Claim 1 and further comprising a movable wastewater supply tank positioned under the outer jacket for supplying wastewater to the delivering means, the tank including means for filtering larger particles from the wastewater before delivery to the fluid vessel.

Claim 5 (currently amended): Apparatus for treating wastewater according to Claim 1, wherein the delivery means, the heating element and the vapor exhaust means are electrically operated, and further comprising electrical circuit means for providing electrical power and a switch box accessible to an operator and containing electrical switches to set the operating temperature of the heating means heat transfer liquid and the time of operation of the heating element and vapor exhaust means.

Claim 6 (original): Apparatus for treating wastewater according to Claim 1 and further comprising a disposable liner made of a waterproof and nonporous material insertable into and lining the vessel and receiving the wastewater, the wastewater contained in the liner being

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evaporated and leaving a residue of contaminants contained in the liner to be disposed of with the liner.

Claim 7 (currently amended): The apparatus according to Claim 6 in which the liner comprises a silicone rubber coated, fiberglass woven fabric capable of withstanding heat [[up]] to about 450° F.

Claim 8 (currently amended): Apparatus for treating wastewater according to Claim 1 and further comprising control means for maintaining the temperatures of the heat transfer liquid and the heating element within a predetermined range of values as the collected wastewater is being heated by activating the heating element substantially only when the temperature of the heating element exceeds the temperature of the heat transfer liquid by less than a preset value and deactivating the heating element when the temperature difference is greater than the preset value.

Claim 9 (currently amended): The apparatus according to Claim 8, wherein the control means comprises at least a first temperature sensor measuring the temperature of the heat transfer liquid and at least a second temperature sensor measuring the temperature of the heating element, and means responsive to the temperatures sensed by the temperature sensors for activating the heating of the heating element substantially only when the difference in the temperatures of the heat transfer liquid and the heating element is less than the preset value and deactivating the heating element when the temperature difference is greater than the preset value.

Claim 10 (re-presented): A compact, self-contained and moveable apparatus for treating wastewater containing a substantial volume of water and substantially lesser amounts of, at water boiling points, non-volatile contaminants, the apparatus comprising:

(a) a fluid vessel to collect wastewater and having at least a partially open top wall, side walls and a bottom wall,

(b) means for delivering wastewater to the fluid vessel,

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(c) a heating vessel surrounding and spaced from at least the side walls and the bottom wall to form an interior heating chamber between the heating vessel and the fluid vessel,

(d) a heating element positioned in the heating chamber to generate heat sufficient to vaporize the wastewater and form water vapor,

(e) a heat transfer liquid having a boiling point substantially in excess of the boiling point of the collected wastewater and filling at least a substantial portion of the heating chamber and immersing the heating element to transfer heat generated by the heating element to the fluid vessel walls to heat the collected wastewater until it is vaporized,

(f) an outer jacket substantially surrounding the heating vessel and spaced from the heating vessel to define an insulating space between the jacket and heating vessel,

(g) vapor exhaust means for expelling the water vapor from the fluid vessel, and

(h) control means for maintaining the temperatures of the heat transfer liquid and the heating element within a predetermined range of values as the collected wastewater is being heated by activating the heating element when the temperature of the heating element exceeds the temperature of the heat transfer liquid by less than a preset value, the control means comprising at least a first temperature sensor measuring the temperature of the heat transfer liquid and at least a second temperature sensor measuring the temperature of the heating element, and means responsive to the temperatures sensed by the temperature sensors for activating the heating of the heating element when the difference in the temperatures of the heat transfer liquid and the heating element is less than the preset value and deactivating the heating element when the temperature difference is greater than the preset value. The apparatus according to Claim 9, wherein the first temperature sensor [[is]] being suspended in the heat transfer liquid and spaced from the heating element and the walls defining the heating chamber, and the second temperature sensor [[is]] being in contact with the heating element.